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ZAMONAVIY TA'LIMDA ISLOHOTLAR VA TEXNIK TAFAKKUR

ilmiy jurnali

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“ZAMONAVIY TA'LIMDA ISLOHOTLAR VA TEXNIK TAFAKKUR”

ilmiy jurnali

Mazkur ilmiy to'plamda “Zamonaviy ta'limda islohotlar va texnik tafakkur” ilmiy jurnaliga taqdim etilgan ilmiy maqolalar, tezislar hamda ilmiy-tadqiqot natijalari o'rin olgan. Jurnal zamonaviy ta'lim tizimini rivojlantirish, ta'lim jarayoniga innovatsion pedagogik va axborot texnologiyalarini joriy etish, ta'lim mazmuni va metodlarini takomillashtirish, shuningdek, pedagogika, texnika va muhandislik yo'nalishlarining o'zaro integratsiyasini rivojlantirishga qaratilgan ilmiy izlanishlarni yoritishga ixtisoslashgan.

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TRADE OPENNESS AND REGIONAL ECONOMIC DISPARITIES IN UZBEKISTAN

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Abstract: This study examines trade intensity and disparities in GRP per capita across 14 regions of Uzbekistan using official data for 2018–2025. Mean regional trade intensity declined from 38.74% to 36.68%, while log dispersion of GRP per capita increased from 0.390 to 0.557; these patterns do not establish a causal relationship. The findings highlight the need to assess domestic value creation and access to trade infrastructure, as regional trade intensity alone is insufficient to indicate inclusive development.

Kalit soʻzlar: trade openness; regional disparities, gross regional product, Uzbekistan; regional development, external trade.

Аннотация. В исследовании рассматриваются интенсивность внешней торговли и различия в валовом региональном продукте (ВРП) на душу населения в 14 регионах Узбекистана на основе официальных данных за 2018–2025 годы.

Средняя региональная интенсивность внешней торговли снизилась с 38,74% до 36,68%, тогда как логарифмический разброс ВРП на душу населения увеличился с 0,390 до 0,557; эти результаты не подтверждают причинную связь.

Полученные результаты указывают на необходимость оценки создания стоимости внутри страны и доступности торговой инфраструктуры, поскольку региональная интенсивность торговли сама по себе недостаточна для характеристики инклюзивного развития.

Ключевые слова: торговая открытость, межрегиональные различия, валовой региональный продукт, Узбекистан, региональное развитие, внешняя торговля.

Annotatsiya. Ushbu tadqiqotda 2018–2025-yillarga oid rasmiy maʼlumotlar asosida Oʻzbekistonning 14 ta hududida tashqi savdo intensivligi va aholi jon boshiga yalpi hududiy mahsulot (YAHM) tafovutlari oʻrganiladi.

Hududlarda oʻrtacha tashqi savdo intensivligi 38,74% dan 36,68% gacha pasaygan, aholi jon boshiga YAHMning logarifmik tarqoqligi esa 0,390 dan 0,557 gacha oshgan; ushbu natijalar sababiy bogʻliqlikni tasdiqlamaydi.

Natijalar mamlakat ichida yaratiladigan qiymat va savdo infratuzilmasidan foydalanish imkoniyatlarini baholash zarurligini koʻrsatadi, chunki hududiy savdo intensivligining oʻzi inklyuziv rivojlanishni ifodalash uchun yetarli emas.

Kalit soʻzlar: savdo ochiqqligi, hududlararo tafovutlar, yalpi hududiy mahsulot, Oʻzbekiston, hududiy rivojlanish, tashqi savdo.

1. Introduction

International integration can expand markets and access to intermediate inputs, but its benefits need not be distributed evenly across a national territory. Firms require transport connections, reliable services, labour and production capacity to participate in external markets.





Differences in those conditions connect a macroeconomic issue—external trade—with a regional issue—the geographic distribution of economic activity.

The empirical question is whether regions with greater recorded trade intensity also have higher output per capita, and whether regional output disparities have narrowed during the observed period. Uzbekistan provides a setting in which all regions share a national currency and trade framework while differing in economic scale and production structure. A comparison across territories can reveal patterns concealed by national totals, provided that recorded trade flows and regional value added are interpreted carefully.

1.1. Research context and contribution

The World Development Report 2009 explains economic geography through density, distance and division (World Bank, 2009). Its framework motivates attention to spatial concentration and market access. It does not imply that every increase in international trade necessarily produces regional convergence. Agglomeration and access costs can change where production expands, and the distribution of output gains may differ from the distribution of household welfare.

The Uzbekistan Country Economic Memorandum discusses private-sector growth and global integration, including conditions that enable firms to reach markets (World Bank, 2025). This provides policy context for investigating geographic differences in recorded trade. The present study does not reproduce the memorandum's national indicators as regional estimates; it constructs consistent territorial ratios directly from official regional observations.

The contribution is a transparent descriptive assessment covering all 14 first-level units over eight years. It separates three questions: how regional trade intensity changed, how output dispersion evolved, and how the two measures were associated within each year. Keeping these questions separate prevents a positive cross-sectional correlation from being mistaken for evidence that trade caused rising disparities.

2. Methods

2.1. Data and territorial coverage

Annual data were retrieved on October 7, 2026 from the National Statistics Committee's SIAT platform. Exports use indicator 1.08.02.0004 and imports use indicator 1.08.03.0001, both in million US dollars. Nominal GRP uses indicator 1.01.03.0001, in billion soums. GRP per capita uses indicator 1.01.03.0003, in thousand soums. The analysis selects 2018–2025 and excludes district and subordinate-city rows to prevent double counting.

The sample comprises the Republic of Karakalpakstan, 12 regions and Tashkent city. Tashkent region and Tashkent city are separate observations. All four regional variables are





available for every selected unit and year. Annual average exchange rates come from World Development Indicators, PA.NUS.FCRF, sourced from IMF International Financial Statistics. The retrieved exchange-rate series contains no missing study-year observations.

The dataset is a statistical snapshot rather than a permanently fixed series. SIAT metadata indicate revisions to regional accounts, including treatment of the non-observed economy. Recent-year estimates can be revised. The eight-year comparison therefore uses the same retrieved vintage throughout, and future replication should record retrieval dates and reassess results after substantial revisions.

2.2 Measurement and analytical scope

For region i and year t , trade intensity is $O_{it} = 100 \times (X_{it} + M_{it}) \times e_t / (1,000 \times Y_{it})$, where X and M are million-dollar exports and imports, e is soums per dollar, and Y is GRP in billion soums. The factor 1,000 aligns million and billion units. Annual average rates provide a consistent approximation to currency conversion; they are not actual rates for every transaction.

This ratio measures recorded external trade relative to regional value added. It is a proxy for realised trade exposure, not a direct measure of tariff policy, trade liberalisation or firm participation. Gross trade flows can exceed value added, so ratios above 100 percent are possible. Registration and headquarters attribution also mean that a territorial trade record may not locate all production or final use within that territory.

Let z_{it} denote nominal GRP per capita. Dispersion is $\sigma_t = [\sum_i (\ln z_{it} - \text{mean}_i \ln z_{it})^2 / N]^{1/2}$, with $N = 14$. Additional measures are the population standard deviation divided by the arithmetic mean of z , and $\max(z)/\min(z)$. Every region receives equal weight. These measures describe differences among territorial units, not inequality among individual residents.

Pearson correlations relate O to $\ln(z)$ separately in each year; Spearman correlations check rank association. Sensitivity calculations remove Navoi and Tashkent city, leaving 12 units. The 112 records are not treated as independent cross-sectional observations. No causal regression or hypothesis test is reported. Shared use of GRP in the two measures, omitted structural differences and reverse causation preclude interpreting the correlations as trade effects.

Table 1. Annual regional trade intensity and nominal output dispersion

Year	Mean O, %	Median O, %	Log SD	CV	Pearson r
2018	38.74	31.99	0.390	0.500	0.711
2019	39.61	32.40	0.445	0.581	0.680
2020	37.06	27.96	0.491	0.682	0.479
2021	36.79	27.82	0.485	0.655	0.474





2022	37.18	26.55	0.476	0.636	0.478
2023	38.37	27.73	0.480	0.643	0.501
2024	35.99	26.83	0.536	0.751	0.462
2025	36.68	29.12	0.557	0.792	0.482

Sources: SIAT and WDI; author's calculations. O is recorded trade/GRP. Pearson r relates O to log GRP per capita within the year. All statistics are unweighted across 14 territorial units. Calculations use unrounded data.

3. Results

3.1 Regional trade intensity

The unweighted mean regional ratio declined from 38.74 percent in 2018 to 36.68 percent in 2025. The median declined from 31.99 to 29.12 percent. These statistics do not describe national trade openness: a mean of regional ratios differs from a ratio of national totals and gives a small region the same weight as a large one. National and regional coverage can also differ.

Five territorial units recorded higher endpoint ratios: Jizzakh, Samarkand, Syrdarya, Khorezm and Tashkent city. The remaining nine recorded declines. A lower ratio does not necessarily mean that exports or imports contracted. The denominator can increase faster than recorded trade, and exchange-rate conversion affects the numerator. The endpoint results should therefore be read as changes in relative intensity rather than as a direct measure of successful or unsuccessful trade policy.

Tashkent city had the highest ratio in both endpoint years: 105.34 percent in 2018 and 109.66 percent in 2025. Its position is consistent with concentration of recorded flows, but the aggregate data cannot distinguish headquarters registration from local production and use. The city's ratio is not evidence that its entire GRP was exported.

3.2 Territorial comparison

Table 2 presents the complete territorial comparison. GRP per capita is displayed in million soums for readability, obtained by dividing the source's thousand-soum values by 1,000. These are nominal production measures and should not be read as household incomes or spatially price-adjusted living standards.

Table 2. Regional trade intensity and GRP per capita

Territorial unit	O 2018, %	O 2025, %	GRP/person 2025
Karakalpakstan	30.91	19.11	26.49
Andijan	55.54	51.05	30.85
Bukhara	28.54	25.16	41.40





Jizzakh	18.44	46.11	34.12
Kashkadarya	19.50	16.17	26.86
Navoi	48.56	17.73	152.24
Namangan	42.27	26.90	27.02
Samarkand	34.55	43.38	28.00
Surkhandarya	21.99	15.52	22.22
Syrdarya	23.53	33.92	38.14
Tashkent	68.06	57.44	57.48
Fergana	33.06	31.33	26.60
Khorezm	12.07	19.95	30.71
Tashkent city	105.34	109.66	116.75

Sources: SIAT and WDI; author's calculations. Last column: million soums per person, nominal. Trade intensity combines exports and imports; it is not an export-only ratio.

Jizzakh's ratio rose from 18.44 to 46.11 percent, while Samarkand's rose from 34.55 to 43.38 percent. Conversely, Navoi's ratio fell from 48.56 to 17.73 percent despite having the highest 2025 nominal GRP per capita. These comparisons demonstrate why regional trade intensity and regional output per capita should not be treated as interchangeable rankings.

Andijan and Tashkent region remained relatively trade-intensive in 2025, at 51.05 and 57.44 percent respectively. Surkhandarya had the lowest ratio, 15.52 percent, and the lowest nominal GRP per capita, 22.22 million soums. This combination is an observed endpoint pattern; identifying whether transport access, sector composition or other conditions account for it would require additional evidence.

3.3 Evolution of regional output disparities

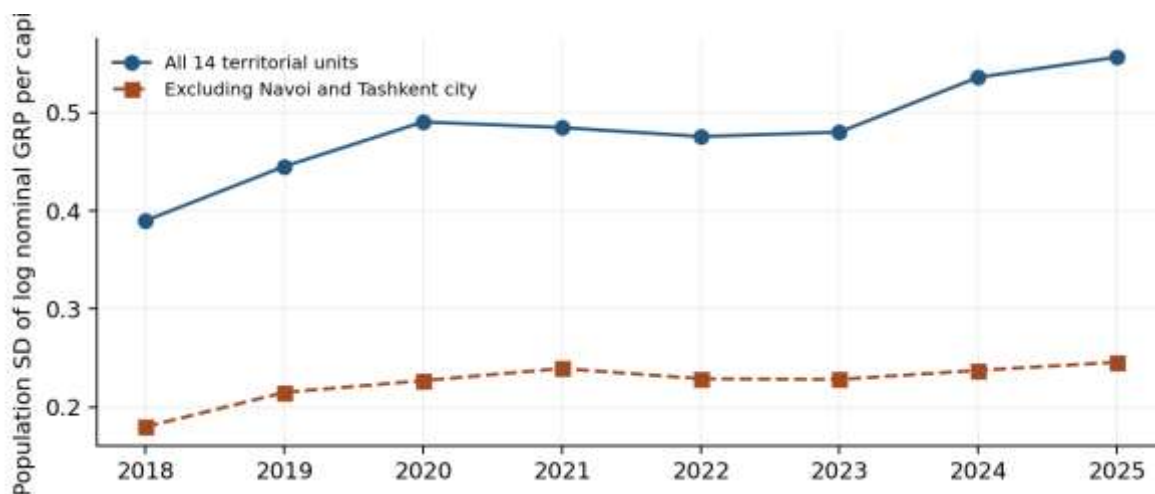




Figure 2. Unweighted standard deviation of log nominal GRP per capita, 2018–2025.

Source: SIAT; author's calculations. The restricted series excludes Navoi and Tashkent city in every year. Higher values indicate greater dispersion across the included territories.

Log dispersion increased from 0.390 in 2018 to 0.557 in 2025, an increase of approximately 42.7 percent relative to the baseline statistic. The path was not monotonic: dispersion reached 0.491 in 2020, fell to 0.476 in 2022, and increased again by 2025. Thus, the evidence establishes wider endpoint dispersion without implying uninterrupted divergence in every intervening year.

The coefficient of variation increased from 0.500 to 0.792. The maximum-to-minimum ratio increased from 3.58 to 6.85. Agreement among these measures supports the descriptive conclusion that nominal output per capita was more uneven across territorial units at the end of the period. Each measure emphasises a different feature of the distribution, and none measures within-region income inequality.

Excluding Navoi and Tashkent city reduces log dispersion substantially, from 0.180 in 2018 to 0.246 in 2025. Nevertheless, dispersion increases by approximately 36.6 percent in the restricted sample. The result therefore does not depend exclusively on the two high-output units. The exclusion is a sensitivity exercise, not a justification for omitting those territories from the main population.

A common national price deflator would subtract the same annual constant from every logged observation and leave that year's log dispersion unchanged. This mathematical property does not make the nominal comparison a measure of real welfare convergence. Regional price levels, different sector-specific prices and production structure remain relevant, while GRP per capita measures production rather than residents' disposable income.

3.4 Association between trade intensity and output

The 2025 Pearson correlation between trade intensity and log GRP per capita is 0.482. The Spearman rank correlation is 0.503. Across the eight yearly cross-sections, Pearson correlations are positive and range from 0.462 to 0.711. Regions with higher recorded trade intensity therefore generally also show higher output per capita, but this relationship is imperfect and sensitive to sample composition.

Removing Navoi and Tashkent city raises the 2025 Pearson correlation to 0.617. Navoi combines high nominal output per capita with a comparatively low trade ratio; Tashkent city combines high values of both. Their different positions show why a single coefficient should be accompanied by a scatterplot and an explicit sensitivity comparison. The restricted coefficient does not supersede the full-sample result.

4. Discussion

Positive within-year association and rising output dispersion can coexist. The first describes how two variables are ordered across regions, whereas the second describes how spread out output levels are. Neither establishes the contribution of trade to changes in regional disparities.





Product specialisation, capital intensity, population composition and business registration can influence both measures, and output growth itself changes the trade ratio denominator.

The findings support a distinction between trade participation and local value creation. A gross trade ratio cannot reveal domestic input content, employment effects or the distribution of gains among residents. Policies aimed at wider participation should assess transport and service access, firm capabilities and links between exporters and local suppliers. These are implications for measurement and policy design, not estimated returns from particular interventions.

5. Conclusion

Official data for 2018–2025 show greater dispersion in nominal GRP per capita across Uzbekistan's 14 first-level territorial units. Log dispersion increased from 0.390 to 0.557, and the increase persisted after excluding Navoi and Tashkent city. Over the same period, mean recorded regional trade intensity declined from 38.74 to 36.68 percent; only five units recorded higher endpoint ratios.

Trade intensity and log output per capita were positively associated within each year, with a 2025 Pearson correlation of 0.482. The evidence does not show that trade caused widening regional disparities or that increasing a trade ratio would necessarily raise local welfare. A credible causal extension requires product- and firm-level trade records, local value-added measures, spatial price information and an identification strategy based on plausibly external variation in market access or exposure.

The practical contribution is a consistent regional baseline with visible calculations and sensitivity checks. Future monitoring should report both recorded external flows and the domestic production and employment associated with them. This would help connect national integration objectives to the distribution of economic opportunities across regions.

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